

THE DEMISE AND REBIRTH OF PLANT VARIETY PROTECTION: A COMMENT ON *TECHNOLOGICAL CHANGE AND THE DESIGN OF PLANT VARIETY PROTECTION REGIMES*

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In *Technological Change and the Design of Plant Variety Protection Regimes*,¹ Mark Janis and Stephen Smith make two novel and provocative claims. They first argue that the legal regime for protecting new plant varieties has become outdated in light of recent changes in technology. They next assert that the fate of the plant variety protection (“PVP”) system illustrates a broader and more disturbing phenomenon in intellectual property law—the potential for *sui generis*, industry-specific intellectual property regimes to become increasingly ineffective over time.

Both arguments run counter to received political and academic wisdom. The authors’ first claim concerning the obsolescence of PVP rules is at odds with the United States’ policy of pressuring developing countries to join the 1991 Act of the UPOV.² That treaty, now nearing its fiftieth anni-

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1. Mark D. Janis & Stephen Smith, *Technological Change and the Design of Plant Variety Protection Regimes*, 82 CHI.-KENT L. REV. 1557 (2007).

2. The acronym “UPOV” refers to the French-language title of the treaty and its governing organization, the *Union internationale pour la protection des obtentions végétales*. For a discussion of United States pressure on developing country governments to join UPOV or ratify the 1991 Act, see GRAIN, *Sprouting Up: UPOV Increases Its Grip on the South*, SEEDLING, July 2002, at 15, available at http://www.grain.org/seedling_files/seed-02-07-pdf.pdf (stating that “industrialised countries, in particular the United States . . . continue to pressurise [sic] the South into providing intellectual property rights for [plant] breeders”); GRAIN, *PVP in the South: Caving in to UPOV* (Sept. 2004) (chart of

versary, is the very embodiment of the existing PVP regime that Janis and Smith challenge. A growing number of states have ratified the UPOV in recent years, expanding the treaty's influence to a diverse array of countries in which commercial plant breeders operate.³ The authors' claim that the PVP system is obsolete thus takes aim not only at an entire treaty system and the national laws associated with it, but also at the multinational industry that has grown up around these legal rules.⁴

The authors' second and more far-reaching claim about the dangers of obsolescence for intellectual property law generally cuts against the scholarly grain. Commentators have recently analyzed whether intellectual property rights should be tailored to different industries and to changes in technology. They have argued that industry- and technology-specific rules and doctrines are superior to a one-size-fits-all regime of patents, copyrights, trademarks, and other forms of intellectual property.⁵ Janis and Smith question this line of scholarship. They argue that general unfair competition principles can be more easily adapted to technological change—in the plant variety context, at least—than exclusive rights and exemptions that take a technological snapshot of an industry's innovation needs at a particular historical moment.

These are thought-provoking contentions and they merit serious attention by intellectual property scholars and policymakers. In this brief comment, I offer three points to amplify the contributions of *Technological Change and the Design of Plant Variety Protection Regimes* and highlight the legal and political consequences of the arguments the article advances. I first discuss the article's analysis of plant breeders' rights as a distinct form of intellectual property protection. Next, I review the likely challenges to implementing the authors' proposal to replace existing PVP rules with un-

countries under pressure to join UPOV), http://grain.org/rights_files/PVP-South-status-Sep-2004.pdf (last visited Mar. 22, 2007).

3. As of June 2007, sixty-four nations were members of UPOV and had ratified one or more of the PVP treaties (formally known as Acts) that the organization has adopted. See Members of the International Union for the Protection of New Varieties of Plants (June 18, 2007), available at <http://www.upov.int/en/about/members/pdf/pub423.pdf>.

4. See, e.g., News Release, Am. Seed Trade Ass'n, Position Statement on Intellectual Property Rights for the Seed Industry (July 15, 2004), available at <http://www.amseed.com/newsDetail.asp?id=97> (indicating the association's support for UPOV and the existing PVP system).

5. See, e.g., Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1581–83 (2003) (arguing that courts should make technology- and industry-specific adjustments to general intellectual property laws); Michael W. Carroll, *One for All: The Problem of Uniformity Cost in Intellectual Property Law*, 55 AM. U. L. REV. 845, 846–60 (2006) (describing the uniformity costs associated with one-size-fits-all intellectual property rules); Stacey L. Dogan & Joseph P. Liu, *Copyright Law and Subject Matter Specificity: The Case of Computer Software*, 61 N.Y.U. ANN. SURV. AM. L. 203, 204–05 (2005) (endorsing judicial adaptation of copyright doctrines in response to the rapid technological changes that occur in the computer software industry).

fair competition principles. Third and finally, I consider the extent to which the obsolescence of plant breeders' rights represents a phenomenon that exists in intellectual property systems more generally.

I. A PRIMER ON THE LAW, POLICY, AND HISTORY OF PLANT VARIETY PROTECTION

The importance of food security to human survival and the widespread interest in intellectual property rights in genetic materials suggest that PVP treaties and domestic laws should be a subject of widespread interest by scholars and policymakers. In fact, nothing could be further from the truth. PVP is, as Janis and Smith candidly state in the introduction to their article, "one of the least studied of all forms of intellectual property."⁶ As one of the few legal scholars who shares the authors' interest in plant breeders' rights, I applaud their effort to publicize and demystify this reputed backwater of intellectual property law and policy.⁷

The traditional justification for plant-related intellectual property protection is easily stated. UPOV treaties and national PVP laws provide incentives for plant breeders to devote the resources, labor, and time needed to improve existing plant varieties. They do so by granting breeders the exclusive right to market the propagating material of the new varieties they develop. In the absence of such exclusivity, third parties could easily free ride on their innovations. Because plant genetic material is naturally self-replicating, innovations expressed in biological form are especially susceptible to unauthorized exploitation. Exclusive rights in new plant varieties thus enable breeders to recoup the costs of making value-added improvements to preexisting biological resources.⁸

As Janis and Smith demonstrate, however, the scope and content of PVP laws do not reflect this simple theoretical premise. The regime is composed of an "unusual stew of provisions" whose ingredients include a dash of copyright law and a pinch of patent law, mixed with a healthy dose of *sui generis* rules.⁹ In addition, as compared to other types of intellectual

6. Janis & Smith, *supra* note 1, at 1558.

7. LAURENCE R. HELFER, FAO LEGAL OFFICE, INTELLECTUAL PROPERTY RIGHTS IN PLANT VARIETIES: INTERNATIONAL LEGAL REGIMES AND POLICY OPTIONS FOR NATIONAL GOVERNMENTS, (2004) [hereinafter HELFER, IPRS IN PLANT VARIETIES], available at <http://fao.org/docrep/007/y5714e/y5714e00.htm> (comprehensively reviewing international and national intellectual property laws relating to plant variety protection); Laurence R. Helfer, *Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L L. 1, 34–42 (2004) (reviewing legal rules relating to plant genetic resources for food and agriculture).

8. HELFER, IPRS IN PLANT VARIETIES, *supra* note 7, at 2–3 (reviewing rationales for PVP treaties and legislation).

9. Janis & Smith, *supra* note 1, at 1565.

property, the global PVP system is quite small. According to recent estimates cited by the authors,¹⁰ roughly 60,000 PVP certificates are in force in all of the now more than sixty UPOV member states—a minuscule number compared to the hundreds of thousands of patent and trademark applications filed and granted worldwide each year.¹¹

The distinctive rules and comparative insularity of the PVP system bear the historical imprint of years of legislative advocacy by commercial plant breeders in Europe and the United States. As Janis and Smith demonstrate, the industry lobbied for PVP laws to meet their immediate market needs instead of designing an optimal intellectual property system for plant-related innovations.¹² At the time these laws were enacted, the commercial plant breeding community implicitly understood the concept of a plant “variety.”¹³ But that concept was neither a precise technical term nor a well-defined legal one. Thus, as techniques for identifying new plant characteristics have shifted from traditional breeding methods based on phenotype (which utilizes the physical appearance of plants) to methods based on genotype (which manipulates a plant’s embedded genetic code), the variety concept has become increasingly ill-suited to plant innovation.

Plant breeders and public officials have made efforts to adapt the variety-based PVP system to this new genetic reality, but have met with only limited success.¹⁴ As Janis and Smith argue, “variety” focuses on physical traits and morphology and cannot be reconciled with a competing conception of plants as genetic datasets that breeders manipulate to express specific functional and aesthetic qualities. Simply stated, the plant variety concept—the lynchpin of the PVP system—is obsolete and needs to be jettisoned in favor of a more technologically suitable alternative. Absent such wholesale revision, the authors contend, the PVP system “can play no more than a meager role in the improvement of plant varieties.”¹⁵

10. *Id.* at 1559 & n.12.

11. See, e.g., Joff Wild, *A Prolific Year In Patenting—2006 Patent Focus Report*, KNOWLEDGELINK (Thomson Scientific, Phila., Pa.), Jan. 2006, <http://scientific.thomson.com/media/newsletterpdfs/2006-01/2006-patent-focus-report.pdf> (stating that the United States Patent and Trademark Office (USPTO), the European Patent Office, and China’s State Intellectual Property Office received 406,000, 180,000, and 130,000 patent applications, respectively, in 2004 alone, and that USPTO granted 165,485 patents in the same year).

12. To the contrary, there is growing empirical evidence that the PVP system incentivizes the proliferation of varieties but not necessarily the development of improved varieties. See Janis & Smith, *supra* note 1, at 1564, 1589 & n.154.

13. *Id.* at 1573.

14. *Id.* at 1577–79.

15. *Id.* at 1589.

II. OBSTACLES TO REFORMING THE PLANT VARIETY PROTECTION SYSTEM

Technological Change and the Design of Plant Variety Protection Regimes makes a persuasive case for revising the PVP system. Yet the article also reveals that the major PVP stakeholders are opposed to substituting molecular markers for phenotypic plant characteristics and divided over the need to adopt more modest changes.¹⁶ This raises a puzzling question: why would the plant breeding industry continue to support an increasingly problematic legal system whose standards of protection have outlived their usefulness?

The article does not attempt to answer this question.¹⁷ It is hardly a novel insight to observe, however, that governments, industries, and consumers often support inefficient or suboptimal technologies or legal rules once they invest the time and effort to master those technologies or rules and structure their economic relationships around them. Extensive work in social science and in law on sunk costs, network effects, and path dependencies has shown just how difficult it is to foment systemic change once a critical mass of actors becomes habituated to the status quo.¹⁸ Public choice dynamics can exacerbate the pressures for stasis, deterring change even when more efficient or effective alternatives are readily available.¹⁹

This interdisciplinary scholarship raises important questions about the implementation of the authors' policy proposals. Janis and Smith recognize that change has significant costs, including the administrative costs of shifting from the existing property rights model to their proposed unfair competition system and the political costs of overcoming opposition from breeders and UPOV officials.²⁰ But they seem uncertain how best to design

16. *Id.* at 1586.

17. The authors speculate that plant breeders may support the current system because they "would inevitably be small players" in the only presently-existing alternative—the utility patent system—and thus "might therefore prefer a plant-specific regime in which breeders would have great political clout." *Id.* at 1612 n.264. As the authors correctly note, however, this supposed preference does not explain why breeders would support "retention of the existing PVP model" rather than "a plant-specific regime that is viable over the long term." *Id.*

18. See PAUL PIERSON, *POLITICS IN TIME: HISTORY, INSTITUTIONS, AND SOCIAL ANALYSIS* 17–53 (2004); Mark A. Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479 (1998).

19. See Mark J. Roe, *Chaos and Evolution in Law and Economics*, 109 HARV. L. REV. 641, 651–52 (1996) (discussing the relationship between public choice analysis and different forms of path dependence).

20. See Janis & Smith, *supra* note 1, at 1586. For insightful analyses of the costs associated with legal change in domestic and international law, see Michael P. Van Alstine, *The Costs of Legal Change*, 49 UCLA L. REV. 789 (2002); Michael P. Van Alstine, *Treaty Law and Legal Transition Costs*, 77 CHI.-KENT L. REV. 1303 (2002).

a new PVP system. On the one hand, their principal proposal to replace existing subject matter rules, exclusive rights, and exemptions with a comprehensive body of unfair competition principles (perhaps administered by an alternative dispute resolution mechanism) would radically alter the legal protection of new plant varieties. On the other hand, the authors also endorse more modest changes—such as requiring deposit of protected varieties in an accessible depository for use by other breeders—and suggest that these incremental reforms could coexist with their principal proposal.²¹

The scope, pace, and sequencing of changes to the PVP system merit greater attention. For example, are a series of minor revisions, a single evulsive shift, or some combination of the two more likely to produce a legal regime that improves upon the status quo?

If existing rules are adapting so poorly to the transition from phenotype to genotype, a wholesale systemic conversion may be superior to either a progression of incremental adjustments or a combined reform strategy. To quote another catchphrase from social science, the PVP regime may be approaching a “critical juncture”—a point at which institutions and rules can jump from one legal or technological paradigm to another.²² When such junctures arise, incremental reforms reduce the pressure for more extensive improvements and thus decrease the likelihood of a paradigm shift. However, persuading an industry whose members benefit from the status quo to support such an evulsive change is a difficult task. Acknowledging these public choice impediments to major reforms and proposing ways to overcome them would help the authors demonstrate that an overhaul of the PVP system is not only legally and economically sensible but also politically plausible.

III. TOWARD A GENERAL THEORY OF INTELLECTUAL PROPERTY OBSOLESCENCE

Technological Change and the Design of Plant Variety Protection Regimes focuses on the current ills of the PVP system and how to remedy them. Embedded in this analysis, however, are hints of a general theory of intellectual property obsolescence. The closest the authors come to articulating such a theory occurs in the article’s introduction and in Part IV,

21. Compare Janis & Smith, *supra* note 1, at 1606 (“We expect that efforts to fine-tune PVP protection through refinements to existing PVP concepts will continue, and we applaud those efforts.”), with *id.* at 1610 (analyzing “major substantive differences between the existing PVP schemes and a proposed unfair competition scheme”).

22. See PIERSON, *supra* note 18, at 51; Wolfgang Streeck & Kathleen Thelen, *Introduction: Institutional Change in Advanced Political Economies*, in BEYOND CONTINUITY: INSTITUTIONAL CHANGE IN ADVANCED POLITICAL ECONOMIES 1, 7 (Wolfgang Streeck & Kathleen Thelen eds., 2005).

where they situate their claims at the intersection of two lines of scholarship—the first analyzing the relative merits and disadvantages of established versus *sui generis* systems of protection, and the second analyzing how intellectual property rules respond to changes in technology. The authors assert that the risk of obsolescence is especially high in “*sui generis*, industry-specific intellectual property regimes like plant variety protection.”²³

Most intellectual property systems (such as patents, copyrights, trademarks, and trade secrets) are governed by established legal paradigms that apply to multiple industries and fields of technology.²⁴ As a result, the authors’ assertions about obsolescence appear to be confined to *sui generis* forms of protection, such as geographical indications, mask works, industrial designs, and non-copyrightable databases.²⁵ One way to assess the broader applicability of the authors’ obsolescence thesis is to disaggregate two features that are conjoined in the PVP system—its *sui generis* rules and its applicability to a single industry. Stated differently, do industry-specific intellectual property rules or *sui generis* rules present a greater risk of obsolescence?

The previous discussion of path dependence and public choice theory suggests, contrary to the authors’ conclusion,²⁶ that industry specificity may be the more serious problem. When intellectual property rules are closely tailored to fit a particular industry, its members have both the incentive and the means to pressure legislatures and courts to retain existing rules long after their social utility has declined. Indeed, there is some evidence that this lag effect occurs even in nominally industry-neutral intellec-

23. Janis & Smith, *supra* note 1, at 1558.

24. See, e.g., Dan L. Burk & Mark A. Lemley, *Is Patent Law Technology-Specific?*, 17 BERKELEY TECH. L.J. 1155, 1156 (2002) (“Patent law has a general set of legal rules to govern the validity and infringement of patents in a wide variety of technologies. With very few exceptions, the statute does not distinguish between different technologies in setting and applying legal standards.”); Kal Raustiala & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, 92 VA. L. REV. 1687, 1763 (2006) (“[F]or the most part, the exclusive rights created by U.S. copyright law are not sensitive to the characteristics of particular industries.”).

25. See Ben Depoorter, *The Several Lives of Mickey Mouse: The Expanding Boundaries of Intellectual Property Law*, 9 VA. J.L. & TECH. 4, ¶ 8 (2004) (discussing “the enactment of *sui generis* or special purpose intellectual property laws, including the protection of semiconductor chips, of gathered information in the form of databases, industrial designs, and plant varieties”) (footnotes omitted); Guido Westkamp, *TRIPS Principles, Reciprocity and the Creation of Sui-Generis-Type Intellectual Property Rights for New Forms of Technology*, 6 J. WORLD INTELL. PROP. 827, 830–31 (2003) (reviewing different forms of *sui generis* protection in international intellectual property laws).

26. Janis & Smith, *supra* note 1, at 1615 (concluding that “*sui generis* intellectual property regimes tend to become locked in to technological models, and that their supporting institutions tend to become impervious to large-scale reform”).

tual property systems if judges modify general subject matter rules to accommodate the needs of specific industries.²⁷

Of course, the nature of the legal rules that govern the innovations produced by an industry may exacerbate or alleviate the risk of obsolescence. “[H]ighly-elaborated, formal rules of protection”²⁸ are likely to be the least responsive to changes in technology. By contrast, more general and malleable rules—such as the unfair competition principles that Janis and Smith advocate to replace the existing PVP system—can more easily be revised and updated.²⁹ Seen from this perspective, the use of unfair competition principles to protect plant innovations mitigates but does not eliminate the risk of obsolescence. Such principles, although no longer *sui generis*, would still be tailored to commercial plant breeders alone and thus remain amenable to inefficient lobbying by that industry. For this reason, lawmakers should design the new PVP system, including its dispute settlement rules, in ways that reduce the opportunities for industry capture.

CONCLUSION

Technological Change and the Design of Plant Variety Protection Regimes offers an insightful legal analysis of plant variety protection, one of intellectual property law’s least understood *sui generis* regimes. The article also makes a persuasive case that the lynchpin of the PVP system—the new plant “variety”—is outdated and needs to be replaced with more flexible unfair competition principles. International and domestic policymakers interested in advancing innovation in the plant breeding industry and legal scholars concerned with the ever-evolving relationship between law and technological change would do well to consider the arguments that the authors advance.

27. See Burk & Lemley, *supra* note 24, at 1157 (endorsing the PHOSITA standard for patent protection in general but criticizing the Federal Circuit’s application of the standard to the biotechnology and computer software industries because “[t]he court has a perception of both fields that was set in earlier cases but which does not reflect the modern realities of either industry”).

28. Janis & Smith, *supra* note 1, at 1608–09.

29. Unfair competition rules have other costs, most notably the loss of *ex ante* certainty and predictability. Janis and Smith make a persuasive case that such costs are not insurmountable in the plant intellectual property context. See *id.* at 1610–14.